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System and Economic Requirements
for Advanced Non Volatile Memories

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June 28, 2002

Modern computing system architectures are inhibited by memory limitations: volatility, low density compared with system needs, low speed compared with CPU speed and high cost compared with the cost of mechanical storage. The lack of memory technologies that satisfy even a subset of the system requirements has forced designers to work around these limitations by creating complex multi-layered memory systems at the expense of system performance and cost.

The rapid transition of the computer industry to pervasive/ubiquitous computing drives the transition from general to embedded computing architectures. It also drives the need for memory technologies which can enable "application agnostic" components and reduce the memory hierarchy levels to a minimum. The new universal memory is expected also to be non volatile, to have symmetric access cycles, as well as speeds comparable to the CPU speed.

In excess of 20 (twenty) NVM technology and technology variations are currently competing for a share of the lucrative memory market. It becomes rather obvious that many of these technologies will have to yield to those which are not only the most economic, but also who best satisfy the system requirements for a true universal memory.

Both memory manufacturers and memory users need an efficient process and objective metrics to assess the potential of the advanced NVM technologies, long before they are productized. Identifying the wining technologies in an early phase can bring about significant savings and put the business at a competitive advantage.

The presentation proposes and discusses objective assessment criteria and an evaluation process. It analyses the 20+ technologies and technology variations from system requirements, manufacturing efficiency and marketing perspectives. It also assesses the merits and demerits of the individual technologies, both in relative and absolute terms.